ADDITIONAL FEE:

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R E M A R K S

The Office Action issued December 12, 2007 has been received and its contents have been carefully considered.

Applicants have amended claim 1 to render its language more clear and definite, in accordance with 35 USC §112.

Claims 1-7, as originally presented, have been rejected under 35 USC §103(a) as being unpatentable over the U.S. Patent No. 5,633,495 to Niehuis ("Niehuis") in view of U.S. Patent No. 4,462,582 to Orloff et al. ("Orloff") in view of an article by van de Walle et al. entitled "Study of Bi_n^{p+} ions Formed in Liquid-Metal Ion Sources" ("van de Walle). This rejection is respectfully traversed for the following reasons:

Independent claim 1, as amended, and claim 6 recite a mass spectrometer and an ion source, respectively, for analysis of secondary ions and post-ionized neutral secondary particles, in which a primary ion beam which contains metal ions with different stages of ionization and

cluster statuses is generated by means of a liquid metal ion source. Out of this beam one of multiple kinds of bismuth ions having a certain stage of ionization and only one mass is filtered by a filtering device to form a mass-pure ion beam. The filtered ions are clusters of at least two bismuth atoms.

The patent to Niehuis describes a time-of-flight secondary mass spectrometer. Here a continuous ion beam is generated with an ion source. From this ion beam, ions of one mass are filtered by filtering means (MF). Niehuis does not say anything about the kind of ion source used and does not mention that only one kind of ions -- that is, ions of one stage of ionization -- is filtered out of the beam. Furthermore, the use of bismuth is not disclosed at all.

The patent to Orloff describes a liquid metal ion source. Although it is noted that this source can also be operated with bismuth, Orloff does not mention that a bismuth ion source has any advantages compared to the other ion sources described by Orloff, as for example Ga and In. The Examiner himself realized that even if the bismuth source of Orloff were used in a mass spectrometer, the essential idea, to filter bismuth clusters of only one mass,

is still missing. There is therefore no reason why a person skilled in the art would combine the ion source of Orloff with the spectrometer of Niehuis. A person skilled in the art would not have any reason to carry out further adaptations or experiments with such a mass spectrometer. The patent to Orloff contains no suggestion that bismuth has any advantages in a liquid metal ion source.

The article by van de Walle describes a liquid metal ion source in which bismuth is used. This reference is a study about the cluster composition in an ion beam and about the formation processes of bismuth clusters in a bismuth liquid metal ion source. However, van de Walle does not describe the use of a bismuth liquid metal ion source in secondary ion mass spectroscopy. In contrast to the Examiner's assumption, this reference does not disclose or suggest that selection of one kind of cluster, or filtering a liquid metal ion source, could have any advantages in a secondary ion mass spectrometer. In van de Walle only a spectrum of the generated ions is produced but not a beam with only one kind of ions for application in secondary ion mass spectroscopy.

In summary, even if a person skilled in the art would obtain a secondary ion mass spectrometer with a liquid metal ion source that uses bismuth, and even if bismuth ions of one mass were filtered from the bismuth (which is not at all suggested by any one of the cited references), such a person would not know to generate a beam with only one kind of bismuth ions; that is, ions of only one stage of charge. None of the references suggests that this would be particularly suitable for secondary ion mass spectroscopy. A person skilled in the art could just as well implement the secondary ion mass spectrometer of Niehuis with a different ion source with different metals and different ion beam compositions. The particularly advantageous effect of clusters, compared to ions consisting of only one atom in the production of secondary ions, is not described in any of the cited references.

Furthermore, none of the cited references makes mention that bismuth is an element for which the portion of clusters in the ions produced in a liquid metal ion source is particularly high, as shown in Figure 2 and described on pages 9 and 10 of this application. Without this surprising

insight, a person skilled in the art would not propose the present invention.

In conclusion, the cited references have no relation to each other, and even if the teachings of these references were combined, they do not disclose or suggest the particularly advantageous effect of a primary ion beam with only one kind of ion. Thus, the present independent claims 1 and 6 distinguish patentably over all of these references.

Since the remaining claims, 2-5 and 7 all depend from either claim 1 or claim 6, these claims are believed to be patentable over the cited references as well.

Accordingly, this application is believed to be in condition for immediate allowance. A formal Notice of Allowance is therefore respectfully solicited.

Respectfully submitted,

By _____
Karl F. Milde, Jr.
Reg. No. 24,822

MILDE & HOFFBERG, LLP
10 Bank Street - Suite 460
White Plains, NY 10606
914-949-3100

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